TOWN OF MITCHELL

PROJECT NO. 59 - S - 29

ANNUAL REPORT

1964

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ONTARIO WATER
RESOURCES COMMISSION

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TOWN OF MITCHELL

PROJECT NO. 59-S-29

ANNUAL REPORT

1964

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May, 1965

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HISTORY

In April 1957, the Town of Mitchell first approached R. M. Dawson, Consulting Engineers, to prepare initial proposals for a sewage disposal project. The first meeting between representatives of the Town, consulting engineer and the Ontario Water Resources Commission to discuss these proposals was held in September 1957.

The town signed an agreement with the Ontario Water Resources Commission to finance, construct and operate the project in December 1958.

The project consists of sanitary sewers, storm sewers, a forcemain, one pumping station of the 'constructed on site' type and a two cell waste stabilization pond.

Construction of the project began in April 1961. The waste stabilization pond, forcemain, pumping station and sanitary sewers were completed by ALMSI Contracting Company. Storm sewers were constructed by Paolatto Construction Company.

The project has been in operation since October 1961. Since the start up time, neither the pumping station nor the waste stabilization ponds have been enlarged.

The total cost of the waste stabilization pond, outfall, pumping station and forcemain was $122,320.

DESCRIPTION OF PROJECT

The Town of Mitchell is served by approximately 5,870 feet of storm sewers ranging in size from 36 to 10 inches in diameter.

The Town is also served by approximately 27,000 linear feet of sanitary sewers, varying in size between 6 inches and 15 inches together with service connections and appurtenances.

The sewage collected by the sanitary sewer system flows by gravity to the wet well of a ' constructed on site' type pumping station. The pumping station, located on the west end of Herbert Street east of the Thames River, discharges the sewage through approximately 3,000 feet of 12 inch transite forcemain to a 41.6 acre two-cell waste stabilization pond. The station is equipped with two centrifugal sewage pumps manufactured by Canada Pump Limited. A Wisconsin air cooled engine is provided on one of the pumps for standby duty. Pump control is accomplished by means of a float switch. An overflow from the wet well to the Thames River as well as an alarm system are provided in the event of emergency.

Oxygen in the pond is supplied through photosynthesis of a family of simple plants collectively termed algae and by absorption from the atmosphere. Aerobic (oxygen using) bacteria in the pond break down and stabilize the organic matter.

When the pond surface is covered with ice and snow, free oxygen is not available. Anaerobic (non-oxygen using) bacteria and sewage fungi thrive under these conditions and the sewage becomes what is characteristically referred to as septic. During the spring ice break-up period when conditions are changing from anaerobic, septic conditions prevail.

With aerobic treatment, the pond effluent should have a greenish colour indicating the presence of algae.

Effluent from both ponds flows to an outfall chamber where the pond depths are controlled by stop log weirs. From the outfall chamber, effluent is conducted via 2,000 feet of 15 inch diameter concrete pipe to the Thames River.

Design data and a diagram of the waste stabilization pond system and appended in Appendices F and G respectively.

OPERATING PROCEDURES

The Division of Plant Operation is responsible for the operation of the entire water pollution control system which includes the sewers, pumping station and waste stabilization pond. In view of the size of the project, an arrangement was agreed upon whereby a part-time employee performs the daily operating duties at the pumping station and pond and the Town of Mitchell forces maintain the sewers. The Operations Engineer supervises the overall operation of the project and the local operator or operators report directly to him. During 1964, Mr. A. Ellens carried out the operational duties at the pumping station and pond.

WASTE STABILIZATION POND OPERATION

The 1964 waste stabilization pond operating results are appended in Appendices A and B.

The pump time totalizer which records the pump running hours was out of service during most of January. However, considering the remaining eleven months, the average daily flow was 274,000 gallons which is lower than the average 1963 daily flow of 291,000 gallons. During 1963 a total of 106.165 million gallons of sewage was treated compared with an estimated 101.500 million gallons treated in 1964.

During the latter part of 1963 leaks were noticed in the dikes of No. 2 pond. Sewage leaking from the pond was flowing into an adjacent field. The farmer who owns this field filed a complaint and, as a result, No. 2 pond was drained during 1963 and all the flow directed to No. 1 pond. No. 1 pond was maintained at a depth of 5 feet.

On May 25, 1964, due to the heavy pond loading, it was decided to refill No. 2 pond. All flow was then directed to No. 2 pond. No. 1 pond was left dormant at its depth of 5 feet and No. 2 pond was filled to depth of 5 feet which it attained in the fall. Inspections of adjacent property to pond No. 2 proved that all leakage had ceased. On October 8, both ponds were placed in parallel operation.

It was decided to operate the ponds in storage throughout the winter. The purpose being to retain the effluent when the treatment efficiency in the ponds was at a minimum. On October 26, draining of both ponds commenced and continued until November 14 when draining ceased.

"Cattails" in No. 2 pond have always presented an operational problem. To ensure that pond No. 2 was at a sufficient depth in the following spring to retard the growth of "cattails" it was decided to fill it first.

As a result all flow was directed to No. 2 pond on November 14 and it was operated in storage for the remainder of the year.

The average raw sewage and BOD effluent from the "grab" samples obtained were 787 ppm and 34 ppm respectively. The average raw sewage and effluent suspended solids concentrations were 578 ppm and 25 ppm respectively. It is interesting to note that during May, June the BOD of the effluent samples were 16 ppm and 13 ppm respectively.

ANNUAL OPERATING COSTS

The 1964 operating costs and the total 1964 costs to finance and operate the water pollution control system are appended in Appendices C and D respectively. In addition, the operating and total costs are represented diagrammatically on a percentage basis in Appendix E.

The total cost to the municipality for sewage treatment during 1964 was $17,477.21. This expenditure includes operating, debt retirement, reserve for contingency and interest costs. Based on the 1964 assessed population of 2,347, the total annual per capita cost was $7.44.

The 1964 operating cost was $2,459.13. This figure includes expenditures for casual payroll, power, repairs and maintenance, water and miscellaneous items.

1964 OPERATING REVIEW

During the latter part of the year, the fence bordering the north section of the pond property and Frank Street was replaced.

The pond area has been declared a game reserve and throughout the year large numbers of wild ducks could be found in the pond area. In addition, wild geese and wild swans were noted on the ponds in the fall.

APPENDICES

APPENDIX A

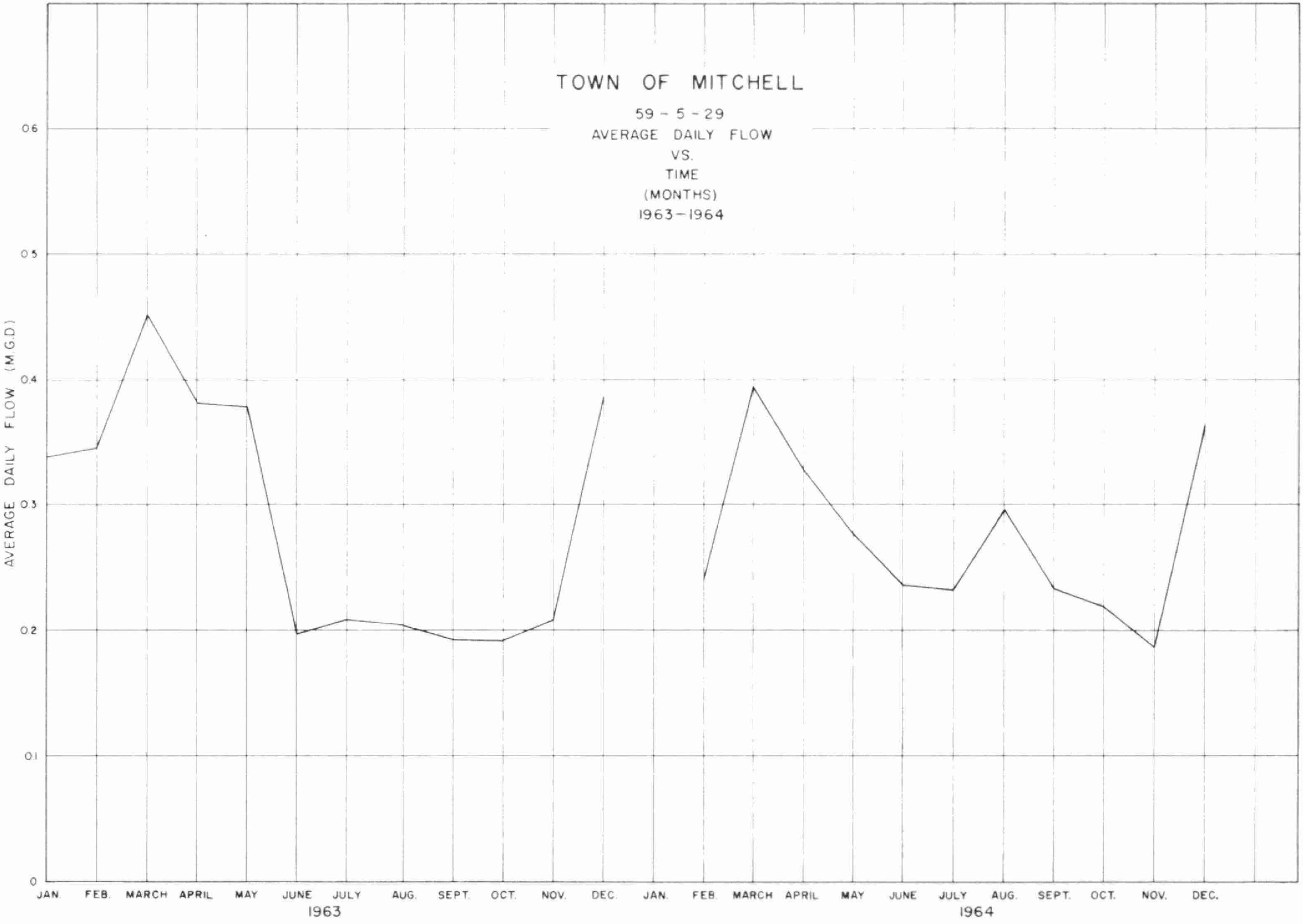
1964 OPERATING RESULTS

MONTH	CELLS IN USE	TOTAL FLOW MONTH (MG)	AVERAGE DAILY FLOW (MG)	RAW SEWAGE		FINAL EFFLUENT	
				BOD (PPM)	S.S. (PPM)	BOD (PPM)	S.S. (PPM)
JAN.	1			245	192	57	12
FEB.	1	6.96	0.240	70	296	30	12
MARCH	1	12.28	0.396	2150	406	52	50
APRIL	1	9.82	0.328				
MAY	1	8.64*	0.278	640	264	16	44
JUNE	1	7.08	0.236	720	892	13	18
JULY	1	7.21	0.233				
AUG.	1	8.86	0.296				
SEPT.	1	6.98	0.233	900	1416	37	13
OCT.	2	6.74	0.217				
NOV.	2	5.58**	0.189				
DEC.	1	11.30	0.365				
AVG.		8.31		787	578	34	25

NOTE:

* Estimated as totalizer inoperative for two days.
** Estimated as totalizer for No. 2 pump inoperative for 5 days.
Both cells in use on October 8. Flow directed to No. 2 pond on November 14.
BOD Biochemical Oxygen Demand
S.S. Suspended Solids
PPM Parts Per Million
(MG) Million Imperial Gallons
Results obtained from grab samples.
The sewage flow was computed from the pump running time multiplied by the pump capacity.
Time totalizer out of service in January.
On the basis of the above flow information, the average daily flow was 274,000 gallons.

APPENDIX B


TOWN OF MITCHELL
59 - 5 - 29
AVERAGE DAILY FLOW
VS.
TIME
(MONTHS)
1963 - 1964
AVERAGE DAILY FLOW (M.G.D.)
0.6
0.5
0.4
0.3
0.2
0.1
0
JAN.
FEB.
MARCH
APRIL
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
1963
JAN.
FEB.
MARCH
APRIL
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
1964

APPENDIX C

MITCHELL

1964

TOTAL OPERATING COSTS

MONTH	TOTAL EXPENDITURE	CASUAL PAYROLL	POWER	GENERAL SUPPLIES	REPAIRS AND MAINT.	SUNDRY	WATER	EQUIPMENT
JAN.	136	57	73	4			1.69	
FEB.	173	78	78		13	3	1.69	
MAR.	169	54	92			22	1.69	
APR.	188	72	111			3	1.69	
MAY	233	90	120	11	3	7	1.69	
JUNE	180	97	79			3	1.69	
JULY	205	103	87			2	1.69	11
AUG.	138	54	79			3	1.69	
SEPT.	148	90	54			2	1.69	
OCT.	268	54	80			133	1.69	
NOV.	169	72	88			3	6.33	
DEC.	452	109	177	53	95	5	11.52	
TOTAL	2459	930	1118	68	111	186	34.75	

YEAR	MG TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER CAPITA PER YEAR	COST PER TON BOD REMOVED
1963	106.165	$2,720	$25.60	$ 1.19	$ 9.06
1964	101.500**	2,459	24.23	1.05*	6.45

Based on 1964 assessed population of 2,347.

* Based on the sum of estimated flow for January and actual flow for the remaining eleven months.

APPENDIX D

TOTAL 1964 COSTS

The total cost to the municipality during 1964 was as follows:

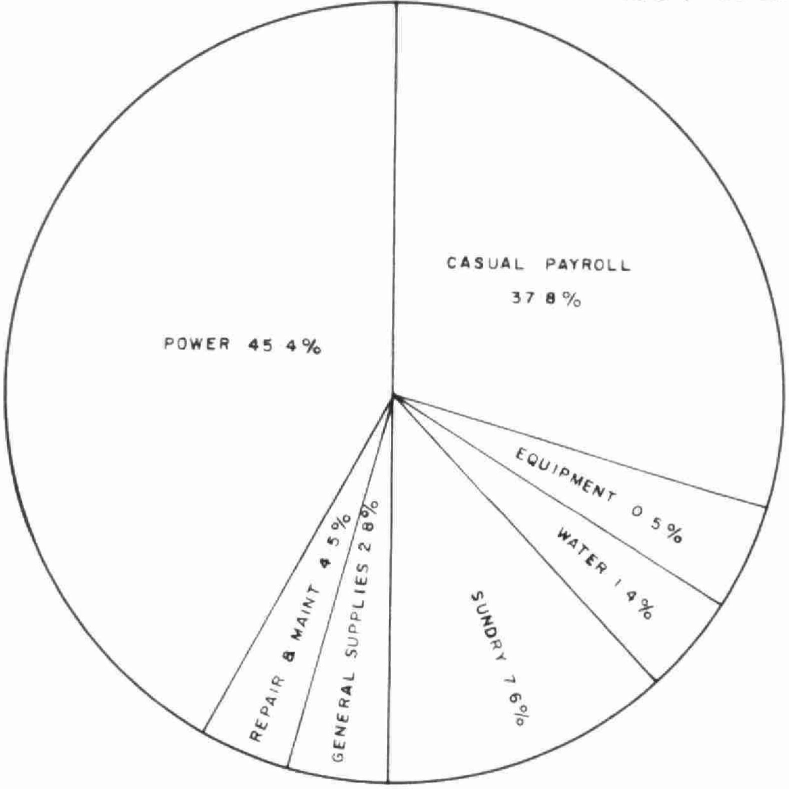
Operating Cost	$ 2,459.13
Debt Retirement	3,342.00
Reserve for Contingency	2,358.00
Interest	9,318.08
TOTAL	$ 17,477.21

NOTE: The amount in the Reserve for Contingencies as of December 31, 1964, was $7,930.30.

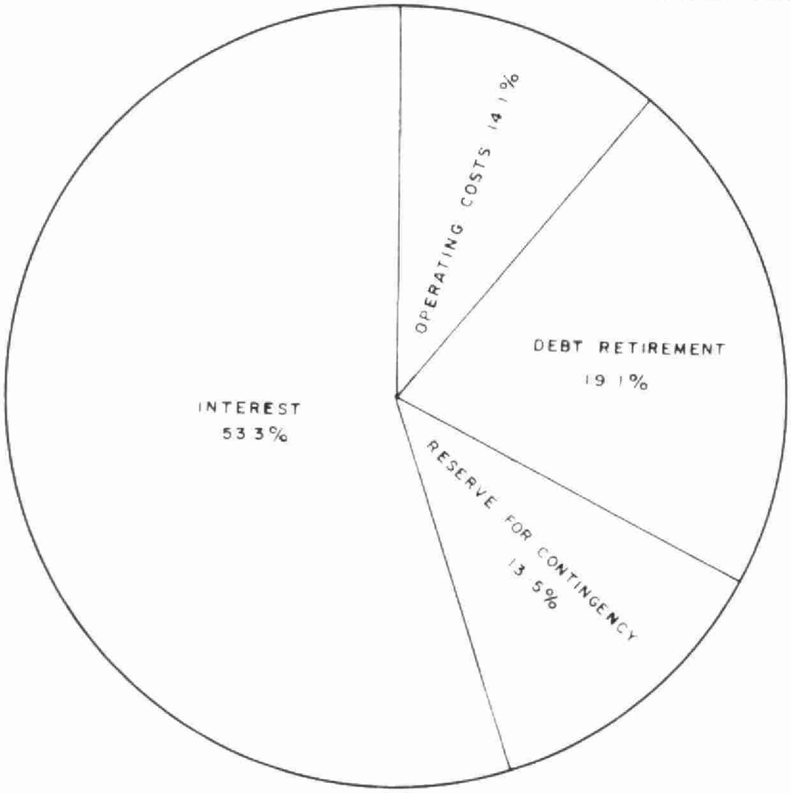
On the basis of the 1964 assessed population of 2,347, the total annual cost of the Mitchell Water Pollution Control System was $7.44 per person.

APPENDIX E

1964 OPERATING COSTS



TOTAL ANNUAL COST



APPENDIX F

DESIGN DATA

Waste Stabilization Pond

(a)	Number of cells	2
(b)	Area per cell	20.8 acres
(c)	Design population:	
	Town	1,000
	Stacey Bros. Creamery	3,810
	TOTAL	4,810
(d)	Design Organic Loading - (5-day BOD, lbs/day)	
	Town	170
	Stacey Bros. Creamery	648
	TOTAL	818
	5-day BOD lbs/acre/day	20
(e)	Effluent discharged to Thames River via 1,000 feet of 15 inch diameter outfall sewer.	

PUMPING STATION

(a)	Pumps	
	Number	2
	Make	Canada Pumps
	RPM	1,750
	Capacity (IGPM) -	
	No. 1	725
	No. 2	760
	Both	970
	Motor	30 HP

(b) Standby Gas Engine

Number	1
Make	Wisconsin Air Cooled

SEWERS

(a) Sanitary

Diameter variance	6 to 15 inches
Linear feet	27,000

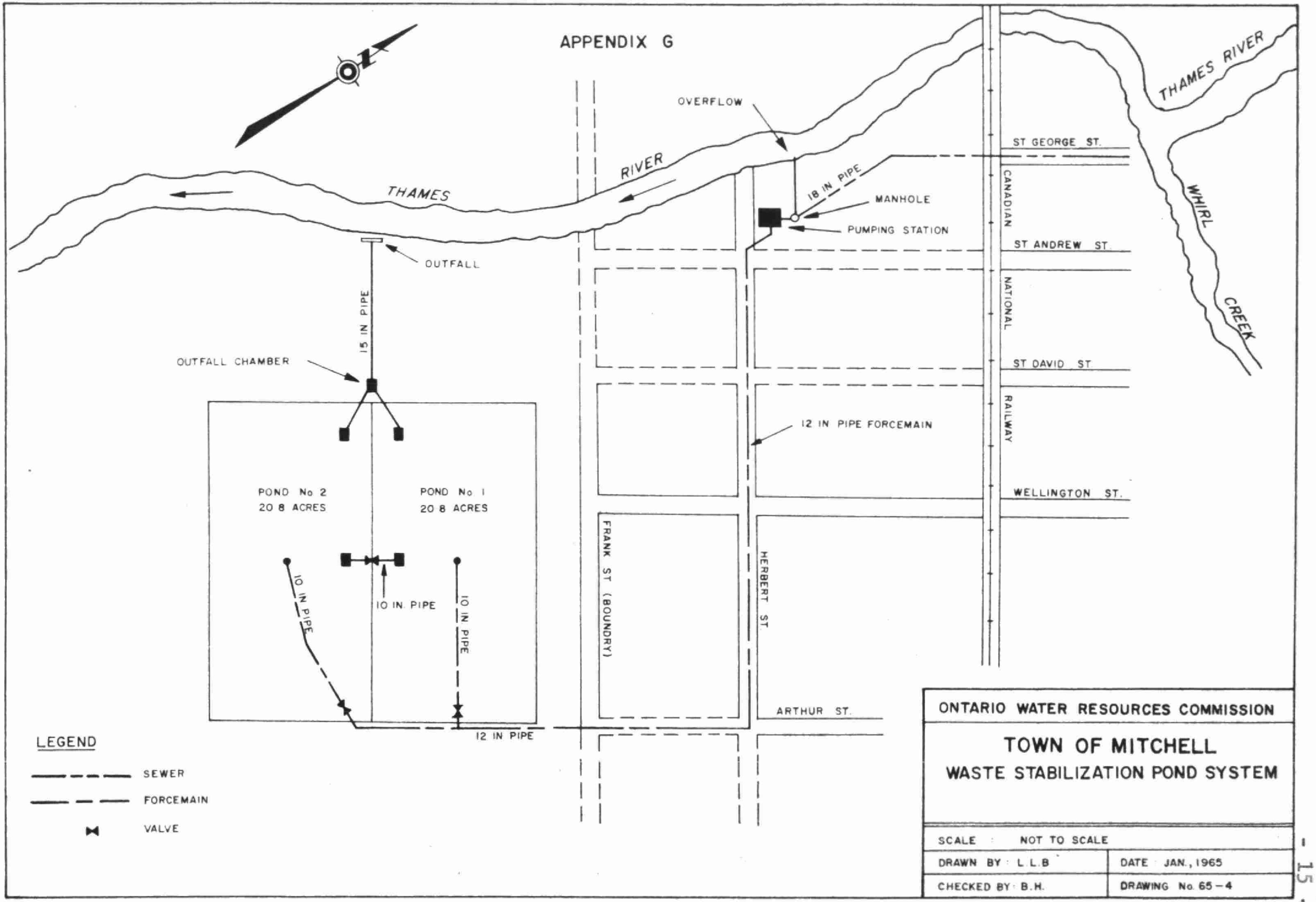
(b) Storm

Diameter variance	10 to 36 inches
Linear feet	5,870

(c) Force main

Diameter	12 inch
Linear feet	3,000
Material	Transite

APPENDIX G



ONTARIO WATER RESOURCES COMMISSION

TOWN OF MITCHELL

WASTE STABILIZATION POND SYSTEM

SCALE : NOT TO SCALE

DRAWN BY : L.L.B

DATE : JAN., 1965

CHECKED BY : B.H.

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